Proposed Scope of Work for
KDIGO Clinical Practice Guideline for the
Evaluation and Management of Candidates for Kidney Transplantation

Introduction
Transplantation is the renal replacement therapy of choice for suitable patients with end-stage kidney disease. However, not all patients are suitable candidates for transplantation, and suitability is often determined by the risk of transplantation relative to the risk of not receiving a transplant. Estimation of risk is a key part of the transplant candidate evaluation. In addition, the candidate evaluation is designed to minimize risk should transplantation is to proceed. This description of the guideline scope is designed to assist the evidence review team and the guideline Work Group in defining literature search strategies and identifying other potential sources of evidence for this guideline.

Background and Principles Underpinning the Guideline

Ethics
Kidney transplantation, using organs obtained from either living or deceased donors, should be conducted in accordance with the Declaration of Istanbul, which provides clear guidelines on ethical practice in this area.

Local considerations
As a global guideline, KDIGO necessarily seeks and considers all available evidence in producing guidelines which are of global relevance. However, the fact that the practice and outcomes of transplantation vary enormously across the globe—between continents, countries and even jurisdictions—requires the reader to consider their local practices and outcomes in interpreting and implementing the guidelines. In particular, considerations should include:
1. Superiority of transplantation over dialysis for the provision of renal replacement therapy. Existing data clearly demonstrate that on average, transplantation achieves superior medical outcomes (survival and quality of life) at lower cost as compared to dialysis, and transplantation is therefore considered to be the medically desirable and economically dominant therapy. However, this conclusion is based upon data from high income countries with good access to both transplantation and dialysis. This conclusion is likely to hold true for low-middle income countries from a medical perspective, though whether transplantation is cheaper than dialysis in this context is less certain and remains to be proven.

2. Access to dialysis and transplantation. In some areas, access to dialysis and/or transplantation may be restricted or absent. This may be due to the lack (or absence) of services, cost of services to the patient, geographical inaccessibility, or other factors. Thus, access must be considered when interpreting these guidelines.

3. Outcomes of dialysis and transplantation. The decision to pursue transplantation in preference to dialysis for any given patient is based upon an expectation of superior outcomes following transplantation. To make this decision, knowledge of expected outcomes from dialysis and transplantation, at a local level, are required. For example, if local transplant outcomes yield a 60% patient survival at 2 years, whereas dialysis yields 70% survival, then transplantation may not be justified. Thus, recommendations from this Guideline should be interpreted and implemented in the context of local outcome data.

4. Local risks involved in transplantation. Regional and geographical variation in risk is evident following transplantation and should be considered in implementing the Guidelines. The risk of infection after transplantation exhibits marked regional variation in type, frequency and severity. For example, the risk of post-transplant reactivation of latent tuberculosis is high among those from endemic areas, yet profoundly low among those from temperate climates. Cancer incidence is also affected by geography, genetics and lifestyle. For example, skin cancer is a common cause of death among Caucasian kidney transplant recipients in Australia, particularly among those residents with high sun exposure, yet skin cancers are far less common and are a rare cause of death in other areas of the world. Thus, local knowledge of likely risks and benefits are required to place the recommendations made within this Guideline into local context.
Scope
This guideline will cover the evaluation and management of possible candidates for kidney transplantation alone, from either a deceased or living donor. It will cover the time period from the first consideration of the need for renal replacement therapy to kidney transplant surgery. It will include adult and pediatric candidates. This guideline will not cover candidates for combined transplantation of a kidney and another organ. Please consult Appendix 1: Proposed Guideline Scope for details.

Target Audience
This guideline is intended for caregivers who refer and/or evaluate patients for possible kidney transplantation.
APPENDIX 1: PROPOSED GUIDELINE SCOPE

1. Access to Transplantation
   • Who should be referred for kidney transplant evaluation (KTE)?
   • Who should make the referral for KTE?
   • Who should evaluate the kidney transplant candidate (KTC)? (e.g., nephrologist, surgeon, dentist, psychiatrist, social worker, KT coordinator, etc.)
   • Who should make the decision about suitability for a kidney transplant (KT)? (e.g., individual vs group decision etc)
   • What process should be undertaken for those declined for KT by their local center?
   • At what level of kidney function (GFR) should a patient be referred for KTE?
   • At what level of kidney function (GFR) should a patient be transplanted?

2. Assessment of Medical Risk

   Age
   • Is advanced age a barrier for KT?
   • In pediatrics, is there a lower age limit for KT?

   Functional Capacity
   • Is frailty, or other forms of functional impairment, a barrier to KT?
   • Is cognitive impairment or developmental delay a barrier to KT?

   Body Habitus
   • Is obesity a barrier to KT?
   • What measures, if any, should be taken to reduce the risk associated with obesity? (e.g. diet, bariatric surgery etc)
   • In pediatrics, is there a size minimum required for KT?
   • Are skeletal abnormalities (e.g., excessive kyphoscoliosis) a barrier to KT?
   • Is extensive abdominal/vascular surgery a barrier to KT?

   Smoking
   • Is smoking a barrier to KT?
   • Should a trial of smoking cessation be mandatory before KT?
**Cause of End-Stage Renal Disease (ESRD)**

- What is the risk of disease recurrence for all causes of ESRD? (see list in Appendix 2)
- What is the risk of graft failure when disease recurrence occurs?
- For diseases known to recur, what testing/specific treatment in the pre-transplant setting can be done to minimize risk of recurrence/graft loss?
- Is the loss of a previous KT due to recurrence a barrier to repeat KT?
- Does the presence of a non-renal transplant a barrier to subsequent KT?

**Infection**

- What active infections preclude KT? (e.g., peritoneal dialysis exit site infection, etc.)
- What infections should be screened for to enable risk modification in the context of KT? (e.g., CMV, EBV, HCV, HBV, VZV, strongyloidies, HIV, HSV, HTLV 1/2, malaria, BK virus, TB, syphilis, etc.)
- For infections known to increase post-KT risk, what specific treatment in the pre-transplant setting can be done to minimize post KT risk? (e.g., treatment of HCV, TB etc)
- What vaccinations should be completed prior to KT? (e.g., influenza, pneumococcal, etc.)

**Malignancy**

- Is a history of cancer a barrier to KT?
- What cancer screening, if any, should be undertaken as part of the KTE?
- What is the waiting period required between successful cancer treatment and KT?
- Can KT proceed with any cancer still present (e.g., skin cancer, breast ductal carcinoma *in situ*, prostate, low-grade cervical cancer, etc)?
- Are any cancers an absolute contraindication to KT? (e.g., myeloma, melanoma etc)

**Pulmonary Disease**

- What level of pulmonary dysfunction is a barrier to KT? (e.g., home oxygen etc)
- Do any specific pulmonary diseases preclude KT? (e.g., bronchiectasis, bronchopulmonary dysplasia, etc.)

**Cardiac Disease**

- What level of cardiac dysfunction is a barrier to KT? (e.g., severe LV dysfunction, angina, etc.)
- Do any specific cardiac diseases preclude KT? (e.g., severe valvular disease, cardiac amyloid, ischemic cardiomyopathy, etc.)
- What cardiac screening tests, if any, should be done before KT?
- What specific treatments in the pre-transplant setting should be done to minimize post-KT risk? (e.g., revascularization, initiation of statins, aspirin, etc)
• Is anticoagulation a barrier to KT? (e.g., clopidogrel, dabigatran, etc.)

**Neurologic Disease**

• Are neurologic conditions a barrier to KT? (e.g., epilepsy, Parkinson's, amyotrophic lateral sclerosis, transient ischemic attacks, etc.)
• What screening tests, if any, should be done before KT? (e.g., carotid Doppler, cerebral magnetic resonance angiography with polycystic kidney disease, etc.)

**Peripheral Vascular Disease**

• What screening tests, if any, should be done before KT? (e.g., leg Dopplers, CT for calcification, angiograms, etc.)
• What level of peripheral vascular dysfunction is a barrier to KT? (e.g., active claudication, etc.)
• Are peripheral vascular conditions a barrier to KT? (e.g., abdominal aneurysm, occlusive iliac disease, distal gangrene, diabetic foot ulcer, etc.)

**Gastrointestinal Disease**

• Are gastrointestinal disorders a barrier to KT? (e.g., active colitis, esophagitis, recurrent/chronic pancreatitis, diverticulitis, etc.)
• What screening tests, if any, should be done before KT? (e.g., ultrasound for gallstones, endoscopy, etc.)

**Liver Disease**

• What level of liver dysfunction is a barrier to KT? (e.g., cirrhosis, nonalcoholic steatohepatitis, etc.)
• What screening tests, if any, should be done before KT? (e.g., alanine aminotransferase test, liver ultrasound, etc.)
• When is a liver biopsy indicated before KT?

**Genitourinary Disease**

• What types of genitourinary disease are a barrier to KT? (e.g., ileoconduit, bladder dysfunction, chronically infected native kidney, reflux, etc.)
• When is a native nephrectomy indicated pre-KT? (e.g., large polycystic kidney, BK virus, etc)
• In patients with a previous failed KT, when is a KT nephrectomy indicated? (e.g., always, only if graft loss due to rejection, etc.)
• When is a cystoscopy indicated before KT? (e.g., cyclophosphamide use, analgesic nephropathy, etc.)
**Hematological Disorders**

- What screening tests, if any, should be done before KT? (e.g., serum protein electrophoresis, thrombophilia, etc.)
- Is significant cytopenia a barrier to KT? (e.g., severe neutropenia, thrombocytopenia, etc.)
- What hematological disorders, if any, are a barrier to KT? (e.g., myelodysplasia, monoclonal gammopathy of undetermined significance, etc.)

**Bone and Mineral Metabolism**

- What screening tests, if any, should be done before KT? (e.g., PTH, bone mineral density, calcium, PO₄, vitamin D, etc.)
- What specific treatment in the pre-transplant setting should be performed to minimize post-KT risk? (e.g., parathyroidectomy, joint replacement for severe osteoarthritis, bisphosphonates, etc.)
- What bone/mineral disorders are a barrier to KT? (e.g., osteoporosis, avascular necrosis, etc.)

**Immunological Assessment**

- What screening tests should be done before KT to assess post-KT risk? (e.g., HLA testing, anti-HLA antibody determination, etc.)
- What specific treatment in the pre-transplant setting should be performed to increase likelihood for KT and minimize post-KT risk? (e.g., desensitization, paired exchange, etc.)

3. **Psychosocial Issues**

- What screening tests, if any, should be done before KT? (e.g., mini-mental status exam, psychiatric consultation, depression screening test, CAGE questionnaire, drug screen, etc.)
- What is the waiting period required between successful treatment of substance and/or psychiatric conditions and KT?
- Which substances and what level of abuse are a barrier to KT? (e.g., marijuana use vs cocaine use, moderate to heavy daily alcohol use, etc.)
- Which pre-KT behaviors predict post-KT adherence and outcomes? (e.g., missing occasional dialysis treatments, poor dialysis diet control, poorly controlled diabetes, etc.)
- What specific treatments in the pre-transplant setting can be done to minimize post-KT non-adherence?

4. **Reassessment while on the Wait-List**

- What screening tests should be repeated while on the wait-list?
- Should patients be re-evaluated while on the wait-list?
APPENDIX 2: CAUSES OF ESRD

Oxalosis (primary, secondary), diabetes, Fabry, sickle cell, amyloidosis, immunotactoid/fibrillary, anti-glomerular basement membrane disease, lupus, scleroderma, vasculitis, atypical hemolytic uremic syndrome, congenital nephrotic syndrome, cystinosis, autosomal dominant/recessive kidney disease, IgA nephropathy, membranous, focal segmental glomerulosclerosis, membranoproliferative, renovascular disease, Alports syndrome, cryoglobulinemia